

## References

- Barbosa, P.S.F. and Pimentel, P.R. 2001, 'A linear programming model for cash flow management in the Brazilian construction industry', *Construction Management and Economics*, vol 19, no. 5, pp. 469 - 480.
- Barnes, NM 1977, 'Cost modeling - an integrated approach to planning and cost control', *Engineering and Process Economics*, pp. 24 - 51.
- Bazarra, G., Back, E. and Mata, F 2000, 'Probabilistic monitoring of project performance using S - curves.', *Journal of Construction Engineering and Management*, vol March/April.
- Cooper, R and Slagmulder, R. 1997, *Target costing and value engineering*, Productivity Press, Montvale, New Jersey.
- Goldratt, E.M and Cox. J. 1989, *The goal: A process of On-going Improvement. Revised Edition*, Gower, Aldershot.
- Guo-li, Y 2010, 'Project Time and Budget Monitor and Control', *Management Science and Engineering*, Vol.4, pp. 56-61.
- Horngreen C.T., Foster, G. and Srikant, M.D. 1990, *Cost accounting: a managerial emphasis. 7th ed*, Englewood, Prentice Hall.
- Howell, G. and Ballard, G. 1996, 'Can project controls do its job?', *Annual Meeting of the International Group of Lean Construction*, Birmingham.
- IMA.Statement-4MM 2000, 'Designing an Integrated Cost Management System for Driving Profit and Organizational Performance', Institute of Management Accountants, USA.
- Johnson, H.T. and Kaplan, R.S. 1993, *Cost and Management Accounting*, Campus, Rio de Janeiro.
- Kaka, A. and Price, A.D.F. 1991, 'Relationship between value and duration of construction projects', *Construction Management and Economics*.
- Kaliba C et al, Mundia, M. and Kanyuka, M. 2008, 'Cost escalation and schedule delays in road construction projects in Zambia', *ScienceDirect*.
- Kaplan, R. and Cooper, R. 1998,.
- Kim, Y 2002, 'The implications of a new production paradigm for project cost control', *PhD Thesis, University of California*, 2002.
- Kim, Y. and Ballard, G. 2000, 'Is the earned - value method an enemy of work flow?', *Annual meeting of the International group of Lean Construction*, Brighton.
- Koskela, L 2000, *An exploration towards a production theory and its application to construction*, Technical Research Centre of Finland, PhD Thesis.

- Krieger, J 1997, 'Establishing activity based costing: Lessons and Pitfalls', *Financial Executives* , vol 3, no. 4, pp. 14 - 17.
- Marchesan, P.R.C., and Formoso, C.T. 2001, 'Cost management and production control for construction companies', *International Group of Lean Construction* , Singapore.
- Maskell, B. and Baggaley, B. 2003, 'Lean management accounting'.
- Monden, Y 1999,.
- Neale, H. and Neale, D. 1989, *Construction Planning* , Thomas Telford Ltda, London.
- Ostrenga, M. et al. 1998, *The Ernst and Young guide to total cost management. 13 Ed*, Rio de Janeiro.
- Philip Scuderi, Jeff Oltman 2007, 'Leading Indicators in Technology Development Project Management', *MST 512 Project Management*.
- Roshana Takim, Akintola Akintoye 2002, 'Performance Indicators for Successful Construction Project Performance', *18th Annual ARCOM Conference*.
- Skoyles 1965.
- Thompson, A 1990, *Architectural design procedures*, Edward Arnold, London.
- Venkataraman, Ray R and Pinto, Jeffrey K 2008, *Cost and Value Management in Projects*, USA.



University of Moratuwa, Sri Lanka.  
Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

## **Appendixes**

Appendix 1: Questionnaire Letter

Appendix 1: Questionnaire



University of Moratuwa, Sri Lanka.  
Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

## **Cost Monitoring and Controlling Practices of the Construction Industry In Sri Lanka**

**Conducted By Samantha Weerasinghe & Supervised By Dr. R.U. Halwatura**

Master of Science in Construction Project Management, Department of Civil Engineering, University of Moratuwa, Sri Lanka



Dear Sir/Madam,

I am a post graduate student of the Faculty of Engineering, University of Moratuwa conducting a Questionnaire for survey in order to fulfil the a partial requirement of the degree of Master of Science in Construction Project Management. This research has been conducting under the supervision of Dr. R.U. Halwatura, Senior Lecture to the Department of Civil Engineering, University of Moratuwa.

The aim of this research is to examine the current cost monitoring and controlling practices of the construction industry in Sri Lanka and professional understands and views on implementation of Integrated Cost Monitoring Systems (ICMS) in organizations of the constructions industry.

### **Integrated Cost Monitoring Systems (ICMS)**

Integration of information is essential if an organization's resources are to be deployed optimally. Integration provides the basis for robust decision analysis because it supports the incorporation of multiple perspectives. Whether an organization is just beginning its journey toward the implementation of new cost management models or has put many of them in place, the need to integrate information and management systems remains the same. Meeting this need is the objective of the integrated cost management system (ICMS) framework.

*(Statement on Management Accounting, Statement Number 4MM, March 2000)  
(Institute of Management Accountants, Montvale, United State of America)*



University of Moratuwa, Sri Lanka.  
Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

This Questionnaire consists of two parts as Part 01 for all professionals and Part 02 for professional who have some knowledge and understanding on ICMS,

Part 01 – Information on personal and organizational details and current cost monitoring practice

Part 02 – Professional's knowledge, understanding and views on ICMS

I hereby guarantee the responses of the questionnaire will be used only for abovementioned purpose and will not be exposed to any third party. The research publications will not contain any personal detail of the respondents. Thanking for your responses and your participation for this research is highly appreciated.

Thank You,

Yours faithfully,

**Samantha Weerasinghe**

BSc(Eng), AMI(SL), GRMICE(UK)

Department of Civil Engineering

Faculty of Engineering

University of Moratuwa

Sri Lanka

Mobile - +94 0718 3294 36

E-mail - [samantha77777@yahoo.com](mailto:samantha77777@yahoo.com)

# Cost Monitoring and Controlling Practices of the Construction Industry In Sri Lanka

Conducted By Samantha Weerasinghe & Supervised By Dr. R.U. Halwatura

Master of Science in Construction Project Management, Department of Civil Engineering, University of Moratuwa, Sri Lanka



*Declaration: This questionnaire for a survey is only for research project to the fulfilment of MSc (CPM) and collected data will not be passed on to any third party and used solely for the purpose of the study.*

## PART 01 – GENERAL INFORMATION

\*- Optional Fields

### SECTION-01 - PERSONAL INFORMATION

1. Name\*

2. Designation

3. Age

 Years

4. Gender

☐ Male

☐ Female

5. Education Level

☐ A/L

☐ Certificate

☐ Diploma

☐ Graduate

☐ Post Graduate

6. Years of experience in the construction industry

 Years

7. Contact Details\*

Mobile:

Email:

8. Specialization of construction experience

☐ Building

☐ Roads & Highways

☐ Water Supply & Drainage

☐ Bridges

☐ Other

9. Computer Literacy

☐ Excellent

☐ Good

☐ Average

☐ Novice

☐ Never

10. Experience with ICMS in any working environment

☐ Excellent

☐ Good

☐ Average

☐ Novice

☐ Never

### SECTION - 02

#### ORGANIZATIONAL INFORMATION

11. Name\*

12. Experience in the construction industry /(Years)

13. Country of Origin

14. Annual construction Turnover(Last Year) /(Rs.M)

15. ICTAD Grade (If Applicable)

C-1 C-2 C-3 C-4 C-5

a.	Buildings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Roads & Highways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	Water Supply & Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Bridges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e.	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questionnaire for a survey on  
**Cost Monitoring and Controlling Practices of the Construction Industry  
 In Sri Lanka**

Conducted By Samantha Weerasinghe & Supervised By Dr. R.U. Halwatura

Master of Science in Construction Project Management, Department of Civil Engineering, University of Moratuwa, Sri Lanka



16. No of Employees		0 - 5	6 - 20	21 - 100	101 - 500	501 over
f.	Engineers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g.	Quantity Surveyors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h.	Non – Technical Managers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i.	Skilled Workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j.	Unskilled Workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SECTION-03:**

**CHARACTERISTICS OF THE EXISTING COST MONITORING SYSTEM IN YOUR PROJECT**

**17. Type of the existing cost monitoring system**

- ☐ In-house built system  
☐ Use Microsoft application software  
☐ Specially configured software  
☐ Well developed ICMS  
☐ None

**18. Employee participation for the cost monitoring process**

	Very High	High	Average	Low	None
Management staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost monitoring unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accounting staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**19. According to your experience, level of difficulty of overall project Management?**

	Very High	High	Average	Low	None
Implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data Collection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyzing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controlling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**20. According to your experience, level of difficulty of deferent phases of Cost Monitoring?**

	Very High	High	Average	Low	None
Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Execution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyzing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controlling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questionnaire for a survey on  
**Cost Monitoring and Controlling Practices of the Construction Industry  
 In Sri Lanka**

Conducted By **Samantha Weerasinghe** & Supervised By **Dr. R.U. Halwatura**

Master of Science in Construction Project Management, Department of Civil Engineering, University of Moratuwa, Sri Lanka



This section is to find the features of the existing method that used in your project in order to analyse the financial situation. Please indicate the possible outcome from your current **Cost Monitoring System (CMS)** used in your project

Question No	Area	Reports can be produced				
		Lagging Indicators		Current Indicators	Leading Indicators	
		Monthly	At Completion	Daily	Next month Forecast	None
21.	Financial Situation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	Physical Work done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	Inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	Manpower & Materials utilization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	Machinery utilization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.	Comparison with budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.	Effects of Inflation & Price Fluctuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.	Analysis of NPV & ROI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.	Analysis of SV & SPI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30. There is unique Cost Monitoring System for the entire organization & nobody is allowed to make any changes or any development at project level

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

31. All Employees of the entire organization contribute towards the successful execution of Cost Monitoring System

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

32. The organization conducts necessary trainings for employees on Cost Monitoring System

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

33. I have been provided all necessary facilities & authorities to execute an identical Cost Monitoring System & enhance it in my project

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

34. I have been encouraged by the organization to enhance the current Cost Monitoring System

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

35. There is neither any organizational requirement nor support to implement a Cost Monitoring System in project level

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

# Cost Monitoring and Controlling Practices of the Construction Industry In Sri Lanka

Conducted By Samantha Weerasinghe & Supervised By Dr. R.U. Halwatura

Master of Science in Construction Project Management, Department of Civil Engineering, University of Moratuwa, Sri Lanka



## PART 02 – SPECIFIC INFORMATION ON ICMS

### SECTION-04:

#### INDIVIDUAL UNDERSTANDING & VIEWS ON USES AND BENEFITS OF ICMS FRAME WORKS

36. The ICMS helps to identify optimal customer / market segments

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

37. The ICMS improves the profitability of key products

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

38. The ICMS supports for improved decision making

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

39. The ICMS reduces miscommunication

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

40. The ICMS optimizes the origination's profitability

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

41. The ICMS increases process effectiveness

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

42. The ICMS integrates financial & non-financial metrics

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

43. The ICMS improves the competitive position

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

44. The ICMS facilitate strategic marketing and operational decisions

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

45. The ICMS supports rapid response to changing conditions

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea



## **Cost Monitoring and Controlling Practices of the Construction Industry In Sri Lanka**

**Conducted By Samantha Weerasinghe & Supervised By Dr. R.U. Halwatura**

Master of Science in Construction Project Management, Department of Civil Engineering, University of Moratuwa, Sri Lanka



**46. The ICMS provides the means to integrate activities and outcomes across processes and entities in the value chain**

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

**47. The ICMS helps to anticipate and react to environmental changes before an organization is affected by them**

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

**48. The ICMS creates an external focus on customer requirement and competitive treats so that customer requirement drive the organization**

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

**49. The ICMS systematically relates all elements, internal & external, so problems are solved holistically rather than incrementally through cross functional integration**

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

**50. The ICMS optimizes profits by ensuring that resources remain focused on value activities, that waste is identified and removed**

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

**51. The ICMS links individual, groups, and organizational incentives to ensure that everyone in the organization understands and is motivated to achieve strategic and operational objectives**

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

**52. The ICMS Communicates across all levels, all process, and all units the needs of the customer, result achieved, problems encountered and solved and remaining challengers to be met**

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree ☐ Don't have a clear idea

Questionnaire for a survey on  
**Cost Monitoring and Controlling Practices of the Construction Industry  
In Sri Lanka**

Conducted By Samantha Weerasinghe & Supervised By Dr. R.U. Halwatura

Master of Science in Construction Project Management, Department of Civil Engineering, University of Moratuwa, Sri Lanka



**SECTION-05:**

**PROBABLE REASONS BEHIND NOT IMPLEMENTATION OF AN ICMS IN THE ORGANIZATION**

(Please answer for following questions if there isn't an ICMS in your organization)

**53. The ICMS is not implemented since it is quite expensive**

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

**54. The ICMS is not implemented since it is too complex**

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

**55. The ICMS is not implemented since most of the employees cannot be adopted**

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

**56. The ICMS is not implemented since most employees have less knowledge on Information Technology (IT)**

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

**57. The ICMS is not implemented since it is not useful**

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

**58. The ICMS is not implemented since it is not compatible with the current system**

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

**59. The ICMS is not implemented since most of the employees don't like to use it**

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

**60. The ICMS is not implemented since there is less knowledge/ interest of top management / owners on ICMS**

☐ Strongly Agree   ☐ Agree   ☐ Disagree   ☐ Strongly Disagree   ☐ Don't have a clear idea

*Thanking you for your valuable participation*